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WATER SUPPLY FACILITIES OF COMMUNITIES OF 25,000 POPULATION AND OVER (1954) INCLUDING STATE TABULATIONS

Ralph Porges

Robert A. Taft Sanitary Engineering Center
Cincinnati, Ohio

5 April 1956

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Water Supply and Water Pollution Program
Robert A. Taft Sanitary Engineering Center, USPHS
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Summary Report
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This report presents a summary and a condensed analytical review of the Inventory of "Municipal Water Facilities - Communities of 25,000 Population and Over, as of December 31, 1954" (1) issued by the Public Health Service, November, 1955. Comparisons have been made with previously published reports to ascertain trends.

Introduction

The Public Health Service of the United States Department of Health, Education, and Welfare, in cooperation with State health departments, has developed a series of inventories of water, sewage, and industrial waste treatment facilities. As early as the second decade of this century, an unpublished compilation "Municipal Plants, Water Treatment in the United States" (8) was assembled from 1911 statistics and later revised as of 1915. The continuing need for inventory data was recognized by the States,

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and in 1931 joint effort resulted in "Census of Active Municipal Water Purification Plants in the Continental United States 1930-31"[9]; a report of the committee on water purification and treatment, Conference of State Sanitary Engineers. The present continuing inventory activity by the Public Health Service as initiated in 1937 by the request and under sponsorship of the Conference of State Sanitary Engineers. A report[2] published in November 1942 summarized 1940 data on water treatment plants in the United States. A report, "Statistical Summary of Water Supply and Treatment Practices in the United States"[3] was issued in 1953 on a 1948 survey. Since the 1954 inventory summation analyzed the data by population groups, a direct comparison with the 1948 inventory is possible.

The 1954 Survey and Inventory encompassed the municipal water facilities of communities of 25,000 population (1950 United States Census) and over, as of December 31, 1954. Included in this group were water districts and water companies serving populations of 25,000 or more. The inventory activity of the Public Health Service will be broadened to include all municipal water supplies in this country and constitute eventually a national inventory.

Data Collection and Assembly

Data sheets had been devised itemizing the desired information; for water treatment processes a coding system was adopted permitting enumeration in process sequence of the various steps used in water treatment. These sheets were completed to the extent possible from existing records of the Public Health Service

supplemented by data from other sources. The data sheets were then sent to the respective state health departments by the Public Health Service regional offices. The information was generally reviewed, revised, and brought up-to-date by representatives of the local facility, who returned the forms to the state health department for additional review. Subsequently, the forms were returned through the regional offices where they were subjected to another review and thence to the Robert A. Taft Sanitary Engineering Center of Cincinnati. Here, all data were checked for errors, and wording was arranged to permit proper recording. Where an error was apparent, the regional offices and, if necessary, the states were advised of the interpretation of the tabulating office and confirmation or clarification was requested. In this fashion it is hoped that the most accurate data possible were recorded.

Presentation of Data

Samples of Inventory data recording sheets PHS No. 2398-2, page 1 and 2, are shown in Figure 1. The information contained in the inventory is summarized by states in Tables 6 through 12: Table 6 shows population statistics, average consumption, services, ownership and source of supply; Table 7, treatment of water by sources; Table 8, filtration and miscellaneous treatment practices; Table 9, treatment methods other than filtration; Table 10, rates of water use; Table 11, water use by domestic, commercial, industrial, and public and other segments of the municipal demand; and Table 12, adequacy of systems and improvements needed. Comparable data for 1948 were also tabulated.

Tables 1 to 5 were developed to illustrate more clearly the national statistics and to depict trends that may have developed since the

3.A

Figure 1. Inventory Data Sheet

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE

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Page _____

MUNICIPAL WATER SUPPLY DATA

Communities of 25,000 population and over (State) Date _____ of _____ pages

STATE AND COMMUNITY OR DISTRICT	1950 POPULATION: ESTIMATED POPULATION SERVED	YEAR OPER. START.: POPS. SUPPLY; POPS. TREAT. PLANT	OWNERSHIP	NUMBER OF SERVICES: NUMBER OF METERS	SOURCE OF SUPPLY	STORAGE: IMPOUNDED: RAW WATER (After Treas.) MG	SAFE YIELD IMPOUNDED: MAXIMUM DEPENDABLE DRAFT (Gr. Water) MGD	TRANSMISSION CAPACITY (Raw) MGD	TREATMENT	TREATMENT PLANT: RATED CAPACITY; OVERLOAD CAPACITY MGD	LINE NO.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
											1
											2
											3
											4
											5
											6
											7
											8
											9
											10
											11
											12
											13
											14
											15

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STATE AND COMMUNITY OR DISTRICT	PLANT OUTPUT: AVERAGE MGD; MAXIMUM MONTH MG; MAXIMUM DAY MG	AVERAGE OUTPUT: DOMESTIC; INDUSTRIAL: COMMERCIAL MGD; PUBLIC & OTHER MGD	LABORATORY CONTROL	PUMPING CAPACITY: RAW WATER; FINISHED WATER MGD	DISTRIBUTION STORAGE: PUMPS TO SYSTEM; ELEVATED MG	WELL DISTRIBUTION SYSTEM SATISFY MAXIMUM DEMAND	IMPROVEMENTS NEEDED	REMARKS	LINE NO.
(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	
									1
									2
									3
									4
									5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15

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1948 survey. Emphasis in these tables was placed on unit values and percentages to balance adequately population growths and other related factors.

It was essential to establish analytical procedures to allow for certain data deficiencies and to permit reasonable summations. Since the estimated population served and average output figures were virtually complete no attempt was made to adjust for these minor instances where such data were missing. In Table 7, depicting treatment of supplies from various sources, the population served by a supply shown as both treated and untreated was arbitrarily divided in half, with one-half credited to treated and one-half credited to untreated. Similarly, in Table 8 a water treated by slow sand filtration and rapid sand filtration was assumed to be equally divided between the two methods. This same practice was applied to all similar data where it was essential to apply a judgement factor. Where only a few blanks were encountered, the existing data were averaged and a factor applied. Table 10 required considerable data adjustment to develop comparable flow statistics. In all tabulations relating to rated capacity, maximum hour, maximum day, and maximum month, available figures were totaled and a ratio obtained between that value and the value of the average daily use, considering only the entries reporting the item in question. This ratio was then applied to the average daily use recorded for the entire state and an adjusted value of the specific item was recorded. The breakdown of average water use by domestic, commercial, industrial, and public and segments was not reported in numerous instances; hence it was decided to summarize in Table 11 only those communities that provided the complete breakdown.

Discussion

As of December 31, 1954 there were 570 municipal entries with a total 1950 census population of 63,954,905 within the group having populations of 25,000 and over (Table 6). In 1948, 422 communities were recorded within the stated population group having a total 1940 census population of 53,212,143.

Table 1.

The estimated population served in 1954 reached 80,752,965. Surface sources supplied 63.3% of the population served, ground sources 13.6%, while 23.1% was served by both a ground and surface supply. In 1948, the population served by the 422 systems totaled 61,864,210 persons. The percentages represented by the three source groups have not changed radically during the intervening years. The population served in 1954 was 26% more than the 1950 census population of 570 communities reflecting a 10% increase over the similar ratio based on 1948 statistics. This is probably the result of (a) the inclusion of water districts and water companies in the 1954 survey, and (b) the development of suburban areas and the willingness of municipalities to accept responsibility for supplying outlying districts with water.

From comparison of the 1948 and 1954 surveys, it is estimated that about 17,000 communities in the United States in 1954 have public water systems serving a total of approximately 115,000,000 people. The 570 communities of 25,000 and over inventoried in 1954 represent only 3.4% of the total number of municipalities but include over 80,750,000 persons, or 70% of the estimated national population served.

Ownership statistics were clouded somewhat by unreported items. The percentage of communities having both private and municipal systems dropped from 3.1% in 1948 to 0.4% in 1954. Communities served by privately owned systems increased from 16.1% to 17.2%, while those with public systems dropped from 79.4% to 76.3%. It is possible that adjustment for water companies and resolution of the 6.1% currently unreported would result in a slight gain in public ownership.

The water systems reported 16,453,138 services and 14,428,995 meters in use (Table 6). This indicates that an average of about 5 persons are handled per service. Eighty-eight percent of the services are metered. A subsequent study will be devoted to the relationship of water consumption to metering.

Table 2.

This table presents treated and untreated supplies by source. The population served by treated supplies in 1954 was 79,516,693. This amounts to 98.4% of the population served, an increase of 14% over 1948. Percentage-wise, treated surface supplies showed an 0.8% reduction although all surface waters are treated; treated ground and surface sources indicated an 11.6% increase. Untreated supplies remained fairly constant, falling from 1.1% to 0.9% between 1948 and 1954. Combined treated and untreated supplies dropped from 14.5% to 0.8%. Over the six year period, the trend is towards providing treatment of ground sources where both ground and surface sources are tapped to supply a community. Also, waters are receiving more miscellaneous treatment, such as softening and iron removal. This will be discussed in more detail later.

Table 3.

Treatment of supplies is tabulated in Table 3 according to major plant function; 79,732,582 persons or 98.7% of the served population in communities - 25,000 and over receive treated water, a 1.2% increase since 1948. Filters are used in purification of water for 55,441,623 or 68.7% of the served population, representing a significant increase of 13.3%. The increase is related primarily to rapid sand filter installations.

The percentage of population served receiving disinfected water increased 1.1%, to 97.2%. Softened water reached 12.8% of the people, while 8.8% received water treated for iron and manganese removal. Both processes showed significant increases. Aerated supplies increased 5.5%, to 25.3%. Taste and odor control measures increased drastically; about 40.8% of the people served received waters so treated, as against 22.9% in 1948. Corrosion control reached 31.2%, an increase of 7.9%.

It appears that the people are demanding and receiving better water. It is interesting to speculate as to the possible influence of increased stream pollution, caused by greater loadings at existing sources of waste discharges and additional and new types of pollutants, on the increase of taste and odor control measures. No doubt both poorer raw water quality and public demand for better treated water gave rise to the significant increase in taste and odor control measures.

Over 14,490,000 or 17.9% of the served population receive water treated by fluoridation. Some plants, of course, merely supple-

ment the natural fluoride already present in the waters. Natural fluorides were reported by 137 plants. Of the latter, 99 had water containing a trace to 0.49 ppm, 17 ranged from 0.50 ppm to 0.90 ppm, while 21 plants had water with natural fluorides exceeding 0.90 ppm.

Experimental studies on water fluoridation in the United States were first initiated in 1945[4]. As of August 1949, 17 fluoridation installations were in operation as experimental or empirical facilities. Only 5 years later, 118 plants, representing 21.5% of the total number of treatment installations serving municipalities with populations of 25,000 and over, fluoridated their waters.

Laboratory control of water quality showed progress. Both chemical and bacteriological control were practiced in 57.3% of the plants in 1954, a rise of nearly 10% since 1948. Rises were observed also in the 1954 statistics regarding bacteriological control (5.4% increase) and chemical control (1.5% increase). Plants without control measures or not reporting any, totaled 26.2% in 1954 as compared to 42.5% in 1948.

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Table 4.

Water demand and rate of usage are extremely important in the design of water systems and treatment facilities. These statistics were reported in sufficient numbers to provide fairly reliable figures. Average daily demand was reported in virtually all instances; other units of usage - maximum hour, maximum day, maximum month, and rated plant capacity - were adjusted to compensate for unreported data. The average daily demand of the population group under discussion was 149 gallons per capita. The mean maximum day was 163% of the average day

and the mean maximum hour 231% of the average day. The mean maximum month was only 17% greater than the average month. Average rated plant capacity was 230 gallons per capita per day. However, in this latter category, a few large plants appeared to reduce unduly the average figure.

Long range trends may indicate increasingly greater per capita demand although comparison of the 1948 and 1954 Inventories fail to show significant changes. Considerable unpublished analytical work on the 1948 survey was done by Thoman[5] on per capita water usage. Even though many communities failed to report on this item, sufficient data were provided to permit development of reasonable estimates. With larger communities, where the percentage reporting is excellent, the figures are very good.

The average daily per capita water consumption by population groups from the 1948 data, is as follows:

WATER USE - 1948[6]

Population group	Average demand gallons/capita/day
Less than 500	116
500 - 1,000	100
1,000 - 5,000	108
5,000 - 10,000	114
10,000 - 25,000	123
25,000 - 50,000	127
50,000 - 100,000	121
Over 100,000	157
U. S. Average	137

It may be observed that with communities of less than 100,000 population, the average per capita consumption did not exceed 127 gallons per day. The average for this segment, that is, the communi-

ties having populations less than 100,000 (1940 Census) is 117 gallons per capita per day. In communities of over 100,000 the demand is 157 gallons per capita per day. The average for the United States in 1948 was 137 gallons per capita per day. Streeter[9] shows a per capita demand of 124 gallons for filtered supplies and 139 gallons per day for all treated supplies in 1930. This latter figure is remarkably close to the 137 gallons per day shown above. Weibel[2] reports for treated waters in 1940, a per capita demand of 119 gallons. Weibel's studies, however, included data from only 29 states. The low per capita value may reflect reduced industrial activity of the recession of the 1930's.

Comparing 1948 statistics with the 1954 survey, the population group 25,000 and over in 1948 had an average per capita consumption of 149 gallons, the same as reported for this population group in 1954. A study by the Department of Commerce in 1953[7] showed a per capita consumption of 148 gallons per day from a like population group. The 1954 water consumption statistics indicate that for cities over 100,000 population, the per capita demand was 154 gallons per day as compared to 157 gallons per day resulting from the 1948 data. Based upon the checks obtained, it is not unreasonable to assume that the average per capita consumption in the United States has not increased greatly in the past several years and probably approximates 140 gallons per capita per day. It would seem practical for specific group data to round off the figures and utilize 120 gallons per capita per day for municipalities with populations less than 100,000 and 160 gallons for communities over 100,000 people.

Only 170 communities reported water usage in terms of domestic, commercial, industrial, and public and other segments (see Figure 1).

Included among these are communities reporting a single figure for two or three uses; in such cases one-half or one-third was arbitrarily assigned to the uses indicated. This occurred numerous times in the following combinations: domestic and commercial, commercial and industrail, domestic and public and other, and occasionally the triple group of commercial, industrial, and public and other.

It must be recognized that the domestic breakdown is, in fact, merely household use. By definition, domestic water was that used in the home for any purpose and home was to include, houses, apartments and trailor camps; commercial water served stores, office buildings, restaurants, garages, and other places of business service; industrial water included that used for manufacturing, mining, processing or producing materials or products, or for production of steam; and public and other water uses included swimming pools, hydrants, fire-fighting, drinking and other fountains, street washing, schools and institutions, leakage and unaccounted-for water.

The results of the 170 communities reporting complete data as discussed are shown in Table 4. The domestic usage was 42.8% of the average, commercial 18.9%, industrial 24.9%, and public and other 13.4%. Bases upon the average demand of 149 gallons per capita per day, this would amount to daily per capita usage of 64 gallons domestic, 28 gallons commercial, 37 industrial and 20 public and other.

Water used in commercial establishments, industries and public places certainly includes such domestic uses as drinking water and sanitary needs. Also, it is reasonable to consider in the overall domestic need, that water necessary for fire-fighting and other public uses, and its portion of leakage an unaccounted-for water.

Table 5.

A total of 322 systems or 56.5% were reported adequate for maximum demand, 79 or 13.9% were reported as inadequate; and 169 or 29.6% failed to report on this item. The improvements needed are also shown in Table 5. It is pertinent to observe that only 4 communities or 0.7% stated that no improvements were needed. Failing to report on this item were 150 or 26.3% of the communities. The rest of the communities, or 70%, share in the various needs indicated.

Acknowledgement

It is not possible in the space available to recognize and acknowledge adequately the help and cooperation of all those participating and making possible the inventory under discussion. Representatives of communities and local water facilities, state health department personnel and members of the Public Health Service have all cooperated in this activity. Sincere appreciation and gratitude is expressed here for all who have so willingly contributed of their time and effort. Particular appreciation is expressed to the clerical staff who have diligently and carefully handled the voluminous data.

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Table 1 - General Summary - Communities and Population Served by Source and Ownership.

Classification	1954 Inventory				1948 Inventory			
	No.	%	Est. Pop. Served	%	No.	%	Est. Pop. Served	%
Communities	570	100	80,752,965	100	422	100	61,864,210	100
Served by Surface Sources	339	59.5	51,149,074	63.3	276	65.4	39,678,185	64.1
Served by Ground Sources	129	22.6	10,996,564	13.6	91	21.6	6,805,670	11.0
Served by both Ground & Surface Sources	102	17.9	18,607,327	23.1	55	13.0	15,380,355	24.9
Ownership-Total	570	100			422	100		
Public	435	76.3			335	79.4		
Private	98	17.2			68	16.1		
Both	2	0.4			13	3.1		
Unreported	35	6.1			6	1.4		

Table 2 - Treated and Untreated Waters by Source of Supply

Classification	1954				1948			
	No.	%	Est. Pop. Served	%	No.	%	Est. Pop. Served	%
Communities	570	100	80,752,965	100	422	100	61,864,210	100
Treated Supplies	548	96.1	79,516,693	98.4	392	92.9	52,185,360	84.4
Surface Sources	339	59.5	51,149,074	63.3	275	65.2	39,625,585	64.1
Ground Sources	113	19.8	10,205,670	12.6	74	17.5	5,803,425	9.4
Both Ground & Surface	96	16.8	18,161,949	22.5	43	10.2	6,753,350	10.9
Untreated Supplies	14	2.5	714,844	0.9	12	2.8	682,270	1.1
Surface Sources	0	0	0	0	0	0	0	0
Ground Sources	14	2.5	714,844	0.9	12	2.8	682,270	1.1
Both Ground & Surface	0	0	0	0	0	0	0	0
Both Treated and Untreated	8	1.4	685,378	0.8	18	4.3	8,996,580	14.5
Surface Sources	0	0	0	0	1	0.2	49,600	0.1
Ground Sources	2	0.3	98,300	0.1	5	1.2	319,975	0.5
Both Ground & Surface *	6	1.1	587,078	0.7	12	2.9	8,627,005	13.9

* The surface fraction is treated in all instances.

Table - 3 - Major Plant Functions

Classification	1954				1948			
	No. Plts.	%	Est. Pop. Served	%	No. Plts.	%	Est. Pop. Served	%
Population Served by Water Systems			80,752,965	100			61,864,210	100
No. Treatment Plants	550	100	79,732,582	98.7	480	100	60,336,095	97.5
Filters	362	65.8	55,441,623	68.7	292	60.8	34,281,860	55.4
Rapid Sand	298	54.2	47,335,055	58.6	241	50.2	28,995,650	46.9
Slow Sand	18	3.3	4,571,444	5.7	24	5.0	2,960,950	4.8
Pressure	19	3.4	1,417,024	1.8	20	4.2	1,336,790	2.1
Anthrafilt, Unreported	27	4.9	2,118,100	2.6	7	1.4	988,470	1.6
Disinfection	539	98.0	78,459,502	97.2	465	96.9	59,442,445	96.1
Softening	76	13.8	10,154,752	12.6	50	10.4	5,727,715	9.3
Iron & Manganese Removal	44	8.0	7,106,899	8.8	25	5.2	1,529,970	2.5
Aeration	146	26.5	20,461,229	25.3	117	24.4	12,241,665	19.8
Taste and Odor Control	202	36.7	32,983,849	40.8	133	27.7	14,181,595	22.9
Corrosion Correction	178	32.4	25,170,399	31.2	118	24.6	13,768,190	22.3
Fluoridation	118	21.5	14,493,032	17.9	-	-	-	-
Natural Fluorides								
Reported	137	24.9						
0.01 to 0.49ppm	99	18.0						
0.50 to 0.99ppm	17	3.1						
greater than 0.99ppm	21	3.8						
Laboratory Control								
Bacteriological	54	9.8			21	4.4		
Chemical	37	6.7			25	5.2		
Both	315	57.3			230	47.9		
None and Unreported	144	26.2			204	42.5		

Table 4 - Water Supply Output Rates

Classification	Million Gallons	Est. Pop. Served	Million Gallons Daily	Gallons per cap. per day	%	Gallons per cap. per mo.
Average Daily Total Demand		80,752,965	12041.546	149	100	4470
Maximum Hour *	1158.894		27813.456	344	231	
Maximum Day *			19649.416	243	163	
Maximum Month *	422794.171			175	117	5236
Rated Plant Capacity *			18541.174	230	154	6900
Distribution of Use (170 municipalities reporting complete breakdown as indicated)						
Average Output			2904.06	149(a)	100	
Domestic			1244.62	64	42.8	
Commercial			547.92	28	18.9	
Industrial			722.73	37	24.9	
Public and Other			388.79	20	13.4	

* Adjusted to provide for unreported data.
(a) Total average per capita consumption from above.

Table 5 - System Adequacy and Improvements Needed

Classification	No. Communities	%
For Maximum Demand	570	100
Systems Adequate	322	56.5
Systems Inadequate	79	13.9
Adequacy Not Reported	169	29.6
Improvements Needed	570	100
Source, Underground	79	13.9
Source, Surface	82	14.4
Transmission	169	29.6
Pumping	150	26.3
Treatment	149	26.1
Ground Storage	103	18.1
Elevated Storage	173	30.4
Distribution System	214	37.5
Other	7	1.2
None	4	0.7
Unreported	150	26.3

Table 6. Summary of Water Facilities by States of Communities 25,000 Population and Over

(1)	Total Number of Communities (2)	1950 Census Population (3)	Estimated Population Served (4)	Average Daily Output Million Gallons Daily (5)	Average Consumption Gallons Per Capita (6)	Number of Services (7)	Number of Meters (8)	Ownership: Public (9)	Private (10)	Both (11)	Unreported (12)	Source of Supply: Ground — Number (13)	Ground — Estimated Population Served (14)	Surface — Number (15)	Surface — Estimated Population Served (16)	Both — Number (17)	Both — Estimated Population Served (18)
ALABAMA	7	723,803	991,600	112.300	113	219,401	218,237	7	-	-	-	2	200,000	5	791,600	0	-
ARIZONA	2	152,272	317,030	55.700	176	77,263	77,200	2	-	-	-	1	93,030	0	-	1	224,000
ARKANSAS	5	260,721	342,564	37.160	108	82,567	77,055	3	2	-	-	1	42,000	4	300,564	0	-
CALIFORNIA	46	5,621,333	7,749,100	1294.430	198	1,697,768	1,598,952	36	8	-	2	15	2,078,444	11	2,338,000	18	3,332,656
COLORADO	3	584,363	746,512	155.960	209	173,129	41,325	3	-	-	-	0	-	1	596,000	2	150,512
CONNECTICUT	21	1,238,504	1,519,695	195.045	128	312,512	290,025	11	8	-	2	0	-	15	1,070,295	6	449,400
DELAWARE	1	110,356	123,900	24.000	194	30,000	-	1	-	-	-	0	-	1	123,900	0	-
DISTRICT OF COLUMBIA	1	802,178	1,103,000	167.500	152	129,003	121,342	1	-	-	-	0	-	1	1,103,000	0	-
FLORIDA	15	1,064,213	1,406,999	221.241	157	369,338	367,578	14	1	-	-	11	1,002,584	2	281,079	2	125,000
GEORGIA	10	685,158	1,381,000	129.480	94	288,193	282,045	10	-	-	-	1	44,000	8	1,137,000	1	200,000
IDAHO	2	60,548	82,000	13.430	164	22,460	21,926	1	1	-	-	1	54,000	0	-	1	28,000
ILLINOIS	28	4,362,932	6,028,650	1210.098	201	840,651	309,238	19	7	-	2	9	572,800	18	5,383,850	1	72,000
INDIANA	19	1,946,931	1,758,600	244.694	139	436,944	428,973	12	7	-	-	5	266,500	9	696,100	5	796,000
IOWA	13	744,029	823,807	88.551	107	214,064	200,588	10	3	-	-	6	308,065	6	312,300	1	209,442
KANSAS	5	436,374	641,600	83.370	130	140,452	140,378	3	1	1	-	3	326,600	1	205,000	1	120,000
KENTUCKY	7	617,769	900,116	111.278	124	189,313	186,928	6	1	-	-	1	48,000	6	852,116	0	-
LOUISIANA	8	971,578	1,289,100	156.885	122	265,362	263,616	7	1	-	-	4	329,000	4	960,100	0	-
MAINE	5	186,033	243,376	31.350	128	65,338	25,588	4	1	-	-	0	-	5	243,376	0	-
MARYLAND	4	1,023,647	1,822,225	292.577	160	411,703	273,582	4	-	-	-	0	-	3	1,751,225	1	71,000
MASSACHUSETTS	37	3,079,295	3,304,918	369.150	112	838,317	793,356	37	-	-	-	1	97,849	33	3,115,580	3	96,149
MICHIGAN	20	3,117,811	4,101,500	660.796	161	757,189	736,037	20	-	-	-	5	357,428	13	3,611,513	2	127,559
MINNESOTA	6	1,080,304	1,065,280	114.100	107	231,237	229,861	6	-	-	-	2	60,000	3	670,280	1	335,000
MISSISSIPPI	7	289,385	380,000	43.100	113	77,415	74,100	6	-	-	1	4	155,000	2	175,000	1	50,000
MISSOURI	10	1,397,633	2,363,100	348.100	147	468,718	345,012	3	6	-	1	1	35,000	8	2,243,100	1	85,080
MONTANA	3	104,299	158,800	33.500	211	36,221	14,887	2	1	-	-	0	-	3	158,800	0	-
NEBRASKA	2	350,001	420,464	69.293	165	98,563	105,399	2	-	-	-	1	110,000	1	310,464	0	-
NEVADA	2	65,251	99,000	36.100	365	28,362	2	1	1	-	-	1	45,000	0	-	1	54,000
NEW HAMPSHIRE	3	145,389	148,000	18.849	123	28,696	25,157	2	1	-	-	0	-	2	120,000	1	28,000
NEW JERSEY	45	2,468,622	3,038,217	551.348	141	557,773	495,225	12	12	-	21	5	281,700	23	1,965,175	17	791,342
NEW MEXICO	3	150,551	200,500	29.800	149	49,390	49,390	2	1	-	-	2	168,500	0	-	1	32,000
NEW YORK	44	10,597,631	11,652,726	1547.866	133	1,453,105	700,802	31	10	-	3	13	1,200,750	29	2,438,307	2	8,016,667
NORTH CAROLINA	11	622,108	827,000	98.836	112	199,210	196,574	10	1	-	-	0	-	11	827,000	0	-
NORTH DAKOTA	2	65,092	69,000	7.500	109	14,522	14,522	2	-	-	-	0	-	2	69,000	0	-
OHIO	39	3,921,570	4,430,852	784.590	160	1,156,694	1,636,139	32	2	-	-	7	675,000	22	3,548,352	5	673,500
OKLAHOMA	6	561,313	658,000	82.300	135	161,519	172,967	6	-	-	-	2	68,000	2	258,000	2	332,000
OREGON	3	452,647	640,183	78.700	123	186,615	182,860	3	-	-	-	0	-	3	640,183	0	-
PENNSYLVANIA	37	4,227,209	6,209,686	936.820	151	1,503,113	1,076,118	20	14	-	3	3	231,000	31	5,812,184	3	166,500
RHODE ISLAND	9	580,923	713,574	72.320	101	137,136	135,336	7	1	-	1	0	-	4	467,574	5	246,000
SOUTH CAROLINA	4	252,044	469,000	52.170	111	88,867	88,867	4	-	-	-	0	-	4	469,000	0	-
SOUTH DAKOTA	2	78,006	90,000	15.500	172	21,593	21,953	2	-	-	-	1	52,000	0	-	1	38,000
TENNESSEE	7	914,417	1,238,363	155.300	125	280,820	273,087	6	1	-	-	2	465,000	4	741,363	1	32,000
TEXAS	23	2,310,251	3,808,990	506.666	136	913,409	907,787	22	-	1	-	5	884,090	11	1,769,860	7	1,169,000
UTAH	3	864,170	313,900	58.500	186	73,315	73,315	3	-	-	-	0	-	0	-	3	313,900
VERMONT	1	33,195	38,500	2.900	75	7,500	7,500	1	-	-	-	0	-	1	38,500	0	-
VIRGINIA	11	999,193	1,361,200	135.375	99	286,284	279,943	10	1	-	-	0	-	10	1,263,200	1	98,000
WASHINGTON	8	948,774	1,206,800	365.980	303	296,038	272,128	8	-	-	-	2	838,800	5	931,000	1	40,000
WEST VIRGINIA	7	335,314	477,800	60.210	126	129,712	127,868	5	2	-	-	1	30,000	5	385,800	1	62,000
WISCONSIN	18	1,365,841	1,575,084	249.888	160	371,194	329,969	16	2	-	-	10	442,684	7	1,042,400	1	30,000
WYOMING	2	95,608	65,700	14.300	218	16,670	16,670	2	-	-	-	1	33,000	0	-	1	32,700
TOTAL	570	63,959,905	80,752,563	12891.946	149	16,453,138	14,428,995	435	97	2	36	189	10,966,564	339	51,149,074	102	18,607,327
1948	422	53,412,183	61,864,210	-	-	-	-	335	68	13	-	91	6,805,670	276	39,678,185	55	15,380,355

Table 7.

Summary by Sources of Treated and Untreated Water Supplies [a]

(1)	Total		All Treated		All Untreated		Both Treated and Untreated		Ground Sources								Surface Sources		Both Ground and Surface Sources					
									Total		Treated		Untreated		Both Treated and Untreated		Total All Treated [c]		Total		Treated		Both Treated and Untreated	
	Number of Communities (2)	Estimated Population Served (3)	Number of Communities (4)	Estimated Population Served (5)	Number of Communities (6)	Estimated Population Served (7)	Number of Communities (8)	Estimated Population Served (9)	Number (10)	Estimated Population Served (11)	Number (12)	Estimated Population Served (13)	Number (14)	Estimated Population Served (15)	Number (16)	Estimated Population Served (17)	Number (18)	Estimated Population Served (19)	Number (20)	Estimated Population Served (21)	Number (22)	Estimated Population Served (23)	Number (24)	Estimated Population Served (25)
ALABAMA	7	881,600	7	991,600	0	-	0	-	2	200,000	2	200,000	0	-	0	-	5	791,600	0	-	0	-	0	-
ARIZONA	8	317,030	8	317,030	0	-	0	-	1	33,030	1	33,030	0	-	0	-	8	-	1	284,000	1	284,000	0	-
ARKANSAS	5	342,364	5	342,364	0	-	0	-	1	42,000	1	42,000	0	-	0	-	4	300,364	0	-	0	-	0	-
CALIFORNIA	46	7,749,100	36	7,077,388	6	477,044	5	[b] 308,678	19	2,078,444	6	1,579,150	6	477,044	1	44,500 [d]	11	5,338,000	18	3,330,656	14	3,160,178	4	454,178 [e]
COLORADO	3	746,512	3	746,512	0	-	0	-	0	-	0	-	0	-	0	-	1	596,000	2	150,512	2	150,512	0	-
CONNECTICUT	85	1,519,695	85	1,519,695	0	-	0	-	0	-	0	-	0	-	0	-	15	1,070,195	6	449,500	6	449,500	0	-
DELAWARE	1	123,500	1	123,500	0	-	0	-	0	-	0	-	0	-	0	-	1	123,500	0	-	0	-	0	-
DISTRICT OF COLUMBIA	1	1,103,000	1	1,103,000	0	-	0	-	0	-	0	-	0	-	0	-	1	1,103,000	0	-	0	-	0	-
FLORIDA	15	1,408,993	15	1,408,993	0	-	0	-	11	1,008,584	11	1,008,584	0	-	0	-	2	281,075	2	125,000	2	125,000	0	-
GEORGIA	10	1,381,000	10	1,381,000	0	-	0	-	1	44,000	1	44,000	0	-	0	-	8	1,137,000	1	200,000	1	200,000	0	-
IDAHO	2	82,000	2	82,000	0	-	0	-	1	59,000	1	59,000	0	-	0	-	0	-	1	23,000	1	23,000	0	-
ILLINOIS	88	6,088,650	87	5,978,350	1	50,300	0	-	9	572,800	8	522,500	1	50,300	0	-	16	5,383,650	1	72,000	1	72,000	0	-
INDIANA	19	1,758,600	19	1,758,600	0	-	0	-	7	866,500	7	866,500	0	-	0	-	9	696,100	5	736,000	5	736,000	0	-
IOWA	13	823,807	13	823,807	0	-	0	-	6	302,065	6	302,065	0	-	0	-	6	312,300	1	209,442	1	209,442	0	-
KANSAS	5	641,600	5	641,600	0	-	0	-	3	316,600	3	316,600	0	-	0	-	1	805,000	1	120,000	1	120,000	0	-
KENTUCKY	7	980,116	7	980,116	0	-	0	-	1	48,000	1	48,000	0	-	0	-	6	852,116	0	-	0	-	0	-
LOUISIANA	8	1,[illegible]100	8	1,269,100	0	-	0	-	4	329,000	4	329,000	0	-	0	-	4	520,100	0	-	0	-	0	-
MAINE	5	893,378	5	893,378	0	-	0	-	0	-	0	-	0	-	0	-	5	893,378	0	-	0	-	0	-
MARYLAND	4	1,802,225	4	1,802,225	0	-	0	-	0	-	0	-	0	-	0	-	3	1,751,225	1	51,000	1	51,000	0	-
MASSACHUSETTS	37	3,308,518	37	3,308,518	0	-	0	-	1	37,749	1	37,749	0	-	0	-	33	3,115,520	3	96,149	3	96,149	0	-
MICHIGAN	20	4,101,500	20	4,101,500	0	-	0	-	5	357,408	5	357,408	0	-	0	-	13	3,616,513	2	127,559	2	127,559	0	-
MINNESOTA	6	1,065,880	6	1,065,880	0	-	0	-	2	60,070	2	60,000	0	-	0	-	3	670,880	1	335,000	1	335,000	0	-
MISSISSIPPI	7	380,000	7	380,000	0	-	0	-	4	155,000	4	155,000	0	-	0	-	2	175,000	1	50,000	1	50,000	0	-
MISSOURI	10	2,353,100	10	2,353,100	0	-	0	-	1	35,000	1	35,000	0	-	0	-	6	2,083,100	1	85,000	1	85,000	0	-
MONTANA	3	158,800	3	158,800	0	-	0	-	0	-	0	-	0	-	0	-	3	158,800	0	-	0	-	0	-
NEBRASKA	2	420,464	2	420,464	0	-	0	-	1	110,000	1	110,000	0	-	0	-	1	310,464	0	-	0	-	0	-
NEVADA	2	99,000	1	54,000	1	45,000	0	-	1	45,000	0	-	1	45,000	0	-	0	-	1	54,000	1	54,000	0	-
NEW HAMPSHIRE	3	148,000	3	148,000	0	-	0	-	0	-	0	-	0	-	0	-	2	148,000	1	88,000	1	88,000	0	-
NEW JERSEY	45	3,038,217	44	2,988,217	1	100,000 [f]	0	-	5	281,700	5	881,700	0	-	0	-	23	1,965,175	17	731,342	16	731,342	1	100,000 [g]
NEW MEXICO	3	200,500	2	172,000	1	28,500	0	-	2	168,500	1	140,000	1	28,500	0	-	0	-	1	32,000	1	32,000	0	-
NEW YORK	44	11,651,749	42	11,576,749	2	75,000	0	-	13	1,200,750	11	1,125,750	2	75,000	0	-	29	8,450,997	2	8,016,667	2	8,016,667	0	-
NORTH CAROLINA	11	627,000	11	627,000	0	-	0	-	0	-	0	-	0	-	0	-	11	627,000	0	-	0	-	0	-
NORTH DAKOTA	2	69,000	2	69,000	0	-	0	-	0	-	0	-	0	-	0	-	2	69,000	0	-	0	-	0	-
OHIO	36	4,990,852	36	4,990,852	0	-	0	-	7	675,000	7	675,000	0	-	0	-	22	3,942,352	5	673,500	5	673,500	0	-
OKLAHOMA	6	658,000	6	658,000	0	-	0	-	2	68,000	2	68,000	0	-	0	-	2	258,000	2	332,000	2	332,000	0	-
OREGON	3	640,183	3	640,183	0	-	0	-	0	-	0	-	0	-	0	-	3	640,183	0	-	0	-	0	-
PENNSYLVANIA	37	6,209,648	37	6,209,648	0	-	0	-	1	231,000	1	231,000	0	-	0	-	32	5,812,148	3	166,500	3	166,500	0	-
RHODE ISLAND	9	733,579	9	733,579	0	-	0	-	0	-	0	-	0	-	0	-	4	467,579	5	266,000	5	266,000	0	-
SOUTH CAROLINA	6	469,000	6	469,000	0	-	0	-	0	-	0	-	0	-	0	-	6	469,000	0	-	0	-	0	-
SOUTH DAKOTA	2	90,000	2	90,000	0	-	0	-	1	52,000	1	52,000	0	-	0	-	0	-	1	38,000	1	38,000	0	-
TENNESSEE	7	1,238,363	7	1,238,363	0	-	0	-	2	465,000	2	465,000	0	-	0	-	4	761,363	1	12,000	1	12,000	0	-
TEXAS	23	3,882,950	23	3,402,950	0	-	0	-	3	854,050	3	854,050	0	-	0	-	11	1,769,850	7	1,169,000	7	1,169,000	0	-
UTAH	3	313,500	2	91,000	0	-	1	222,500	0	-	0	-	0	-	0	-	0	-	3	313,500	2	91,000	1	222,500
VERMONT	1	38,500	1	38,500	0	-	0	-	0	-	0	-	0	-	0	-	1	38,500	0	-	0	-	0	-
VIRGINIA	11	1,361,200	11	1,361,200	0	-	0	-	0	-	0	-	0	-	0	-	10	1,163,200	1	98,000	1	98,000	0	-
WASHINGTON	8	1,206,800	7	1,153,000	0	-	1	53,800	2	235,800	1	182,000	0	-	1	53,800	5	971,000	1	98,000	1	98,000	0	-
WEST VIRGINIA	7	477,800	7	477,800	0	-	0	-	1	52,700	1	52,000	0	-	0	-	5	385,800	1	68,000	1	68,000	0	-
WISCONSIN	18	1,575,068	17	1,496,068	1	39,000	0	-	10	460,648	9	421,648	1	39,000	0	-	7	1,092,420	1	39,000	1	39,000	0	-
WYOMING	2	65,700	2	65,700	0	-	0	-	1	33,000	1	33,000	0	-	0	-	0	-	1	32,700	1	32,700	0	-
TOTAL	570	80,752,965	564	79,516,693	14	714,844	8	[b] 8685,378	129	10,996,564	113	10,885,670	14	714,844	2	98,320	339	52,149,014	102	18,687,387	96	18,181,369	6	387,078
1964	422	51,859,210	350	50,185,360	12	682,270	10	8,991,580	31	6,809,670	24	5,803,425	12	682,270	5	323,975	276	39,678,185	55	15,388,399	43	6,753,399	12	6,647,000

[a] 22,250 duplicated in other categories and must be subtracted to make figures additive.
[b] 31,700 duplicated in other categories and must be subtracted to make figures additive.
[c] 50,000 duplicated in other categories and must be subtracted to make figures additive.
[d] 1964 data reports 1 community serving 43,600 people having both treated and untreated surface water.

Table 8. Summary of Water Supplies Receiving Filtration, and Miscellaneous Treatment

(1)	FILTERS: Total Number (2)	FILTERS: Total Estimated Population Served (3)	FILTERS: Rapid Sand Number (4)	FILTERS: Rapid Sand Estimated Population Served (5)	FILTERS: Slow Sand Number (6)	FILTERS: Slow Sand Estimated Population Served (7)	FILTERS: Pressure Number (8)	FILTERS: Pressure Estimated Population Served (9)	FILTERS: Auths., Other, Unreported Number (10)	FILTERS: Auths., Other, Unreported Estimated Population Served (11)	Disinfection Only or with Miscellaneous Treatment Number (12)	Disinfection Only or with Miscellaneous Treatment Estimated Population Served (13)	Other or Unreported Treatment Number (14)	Other or Unreported Treatment Estimated Population Served (15)
ALABAMA	4	791,600	4	791,600	0	-	0	-	0	-	2	200,000	0	-
ARIZONA	2	112,000	2	112,000	0	-	0	-	0	-	3	205,030	0	-
ARKANSAS	4	342,964	3	300,964	0	-	0	-	1	42,000	0	-	0	-
CALIFORNIA	15	2,468,012	11	1,979,730	0	-	4	488,282	0	-	21	4,614,705	1	35,000
COLORADO	6	516,815	4	278,415	1	119,200	0	-	1	119,200	5	229,697	0	-
CONNECTICUT	10	932,183	7	272,600	3	659,583	0	-	0	-	8	587,512	0	-
DELAWARE	1	123,900	1	123,900	0	-	0	-	0	-	0	-	0	-
DISTRICT OF COLUMBIA	2	1,103,000	1	551,500	1	551,500	0	-	0	-	0	-	0	-
FLORIDA	11	1,055,575	11	1,055,575	0	-	0	-	0	-	0	-	0	-
GEORGIA	9	1,237,000	9	1,237,000	0	-	0	-	0	-	2	353,498	0	-
IDAHO	0	-	0	-	0	-	0	-	0	-	2	144,000	0	-
ILLINOIS	19	5,471,890	16	5,286,850	0	-	0	-	0	-	2	82,000	0	-
INDIANA	16	2,344,433	16	1,344,433	0	-	1	140,000	2	45,000	7	506,500	0	-
IOWA	8	550,357	8	550,357	0	-	0	-	0	-	6	414,167	0	-
KANSAS	3	575,000	3	575,000	0	-	0	-	0	-	3	273,450	0	-
KENTUCKY	7	900,116	7	900,116	0	-	0	-	0	-	2	64,600	0	-
LOUISIANA	9	1,029,100	8	985,100	0	-	0	-	0	-	0	-	0	-
MAINE	2	63,000	2	63,000	0	-	0	-	1	44,000	2	220,000	0	-
MARYLAND	5	1,776,725	4	1,726,725	0	-	0	-	1	-	2	180,974	0	-
MASSACHUSETTS	7	489,495	4	271,931	3	217,564	0	-	1	50,000	1	25,500	0	-
MICHIGAN	11	3,739,893	11	3,739,893	0	-	0	-	0	-	16	2,419,423	0	-
MINNESOTA	3	375,280	3	375,280	0	-	0	-	0	-	6	361,607	0	-
MISSISSIPPI	4	255,000	4	255,000	0	-	0	-	0	-	3	50,000	0	-
MISSOURI	8	2,328,100	8	2,328,100	0	-	0	-	0	-	3	125,000	0	-
MONTANA	3	105,800	2	80,800	0	-	0	-	0	-	1	25,000	0	-
NEBRASKA	2	420,464	2	420,464	0	-	0	-	1	85,000	1	53,000	0	-
NEVADA	0	-	0	-	0	-	0	-	0	-	0	-	0	-
NEW HAMPSHIRE	0	-	0	-	0	-	0	-	0	-	1	58,000	0	-
NEW JERSEY	17	1,068,087	9	823,512	0	-	8	244,575	0	-	8	148,000	0	-
NEW MEXICO	0	-	0	-	0	-	0	-	0	-	13	1,898,530	1	85,600
NEW YORK	23	6,464,007	15	5,615,910	4	219,397	3	444,000	1	185,000	11	4,786,567	6	385,750
NORTH CAROLINA	11	752,000	10	[illegible]500	0	-	0	-	1	16,500	1	75,000	0	-
NORTH DAKOTA	2	69,000	2	69,000	0	-	0	-	0	-	0	-	0	-
OHIO	25	4,531,352	25	4,531,352	0	-	0	-	0	-	6	379,500	0	-
OKLAHOMA	4	986,000	3	945,000	0	-	0	-	1	41,000	2	68,000	0	-
OREGON	1	56,000	1	56,000	0	-	0	-	0	-	8	589,183	0	-
PENNSYLVANIA	38	5,822,200	23	1,382,700	3	2,727,500	5	-	6	572,000	10	898,498	1	123,000
RHODE ISLAND	8	617,974	6	595,974	1	11,000	1	11,000	0	-	3	75,600	0	-
SOUTH CAROLINA	3	309,000	3	309,000	0	-	0	-	0	-	1	160,000	0	-
SOUTH DAKOTA	1	52,000	0	-	0	-	0	-	1	52,000	1	38,000	0	-
TENNESSEE	6	1,182,363	5	757,363	0	-	0	-	1	425,000	2	56,000	0	-
TEXAS	23	2,836,360	19	2,580,360	0	-	0	-	4	256,000	7	966,220	0	-
UTAH	0	-	0	-	0	-	0	-	0	-	4	239,600	0	-
VERMONT	1	38,500	1	38,500	0	-	0	-	0	-	0	-	0	-
VIRGINIA	16	1,328,534	12	1,139,367	1	30,000	2	99,167	1	75,000	1	32,666	0	-
WASHINGTON	0	-	0	-	0	-	0	-	0	-	8	1,179,500	0	-
WEST VIRGINIA	9	477,800	6	345,400	0	-	0	-	3	132,400	0	-	0	-
WISCONSIN	8	1,110,084	6	1,036,084	1	36,000	0	-	1	38,000	7	399,000	1	27,000
WYOMING	1	32,700	1	32,700	0	-	0	-	0	-	1	33,000	0	-
TOTAL	362	55,441,623	298	47,335,095	18	4,571,444	19	1,417,024	27	2,118,100	183	23,754,609	18	536,350
1948	292	38,281,860	241	28,995,650	24	2,960,950	20	1,336,790	7	988,470	182	26,539,290	-	-

Table 9. Summary of Treatment Methods Other Than Filtration

	Plants With Disinfection		MISCELLANEOUS PLANT FUNCTIONS												Laboratory Control				Natural Fluorides		
			Softening		Iron & Manganese Removal		Fluoridation		Aeration		Taste & Odor Control		Corrosion Correction								
(1)	Number (2)	Estimated Population Served (3)	Number (4)	Estimated Population Served (5)	Number (6)	Estimated Population Served (7)	Number (8)	Estimated Population Served (9)	Number (10)	Estimated Population Served (11)	Number (12)	Estimated Population Served (13)	Number (14)	Estimated Population Served (15)	A (16)	O (17)	BS (18)	Unreported (19)	< 0.5 ppm (20)	0.5-0.9 ppm (21)	> 0.9 ppm (22)
ALABAMA	6	931,600	0	-	0	-	1	65,000	1	140,000	0	-	4	791,000	1	3	-	2	1	-	-
ARIZONA	5	317,030	0	-	0	-	0	-	0	-	2	296,000	0	-	-	-	3	2	-	-	-
ARKANSAS	4	342,364	0	-	1	42,000	1	180,364	1	180,364	3	300,364	1	180,364	-	1	3	-	1	1	-
CALIFORNIA	[illegible]	7,237,096	5	898,100	0	-	2	1,410,000	12	1,225,630	[illegible]	1,282,132	7	894,316	4	1	9	23	6	1	-
COLORADO	11	746,512	0	-	0	-	0	-	1	149,000	4	596,000	0	-	-	4	5	2	-	2	3
CONNECTICUT	18	1,519,695	0	-	0	-	1	80,000	9	661,600	7	782,600	10	628,995	3	1	5	9	1	-	-
DELAWARE	1	123,900	0	-	0	-	0	-	0	-	0	-	0	-	-	-	1	-	-	-	-
DISTRICT OF COLUMBIA	2	1,103,000	0	-	0	-	1	551,500	0	-	2	1,103,000	2	1,103,000	-	-	2	-	-	-	-
FLORIDA	17	1,408,999	8	897,000	2	[illegible],000	3	512,000	11	623,999	3	366,075	4	236,361	8	-	10	3	8	1	-
GEORGIA	11	1,381,000	0	-	0	-	4	261,000	0	-	3	325,000	9	1,337,000	-	-	10	1	1	-	-
IDAHO	2	82,000	0	-	0	-	0	-	0	-	0	-	0	-	-	-	-	2	1	1	-
ILLINOIS	23	5,978,350	8	487,350	6	488,300	4	240,750	4	146,000	11	5,218,850	4	4,576,250	8	1	12	7	3	-	3
INDIANA	22	1,758,600	2	170,000	3	125,600	8	907,000	7	317,100	12	1,348,500	2	180,600	5	1	15	1	7	1	-
IOWA	13	823,807	4	347,742	1	88,615	4	244,500	3	33,315	7	521,742	3	377,448	5	1	5	2	5	2	1
KANSAS	5	641,600	2	370,000	0	-	0	-	2	370,000	2	325,000	1	290,000	-	1	3	1	1	1	-
KENTUCKY	7	900,116	1	48,000	0	-	4	668,000	3	188,000	6	852,116	0	-	-	1	6	-	-	-	-
LOUISIANA	10	1,249,100	3	639,100	2	109,000	0	-	4	341,000	5	252,000	5	489,000	1	1	7	1	4	-	1
MAINE	4	243,574	0	-	0	-	0	-	1	33,000	1	30,000	2	63,000	-	-	3	1	-	-	-
MARYLAND	6	1,802,225	1	50,000	0	-	4	1,752,225	2	440,000	2	181,000	5	1,802,225	-	-	6	1	5	-	-
MASSACHUSETTS	28	3,224,449	0	-	1	48,625	1	31,395	4	274,131	2	111,931	6	307,335	2	1	4	16	2	-	-
MICHIGAN	17	4,101,500	5	521,500	1	44,000	9	630,640	1	48,000	11	3,739,893	3	188,893	2	-	13	2	9	-	1
MINNESOTA	6	1,065,280	2	868,460	0	-	1	335,000	1	335,000	2	640,280	0	-	1	-	3	2	-	-	2
MISSISSIPPI	7	280,000	0	-	1	30,000	1	30,000	1	30,000	2	190,000	1	140,000	-	1	1	5	1	-	-
MISSOURI	9	2,363,100	4	1,451,000	0	-	0	-	2	180,000	3	193,100	1	660,000	2	2	5	-	2	1	1
MONTANA	3	158,800	0	-	0	-	0	-	0	-	2	105,800	0	-	1	-	2	-	1	2	-
NEBRASKA	2	480,464	0	-	1	110,000	0	-	1	110,000	1	310,464	0	-	-	-	1	1	-	1	-
NEVADA	1	54,000	0	-	0	-	0	-	0	-	1	54,000	0	-	-	-	-	1	-	-	1
NEW HAMPSHIRE	4	148,000	0	-	0	-	2	28,000	0	-	0	-	1	14,000	-	-	-	4	-	-	-
NEW JERSEY	29	8,724,017	0	-	5	147,075	4	99,500	8	297,714	8	826,137	10	1,312,737	-	1	24	5	-	-	-
NEW MEXICO	2	172,000	0	-	0	-	0	-	0	-	0	-	1	32,000	-	1	-	1	1	1	-
NEW YORK	30	10,384,374	0	-	5	4,787,000	7	564,000	16	9,345,265	12	816,090	10	966,268	6	-	25	7	-	-	-
NORTH CAROLINA	11	827,000	0	-	0	-	9	400,000	1	33,000	7	605,000	10	752,000	-	-	11	-	9	-	-
NORTH DAKOTA	2	69,000	2	69,000	0	-	1	41,000	2	69,000	1	41,000	0	-	-	-	1	1	2	-	-
OHIO	32	4,890,852	14	1,800,000	1	38,000	6	515,000	5	191,000	19	3,820,852	13	1,478,300	3	2	23	3	12	1	-
OKLAHOMA	6	694,000	2	323,000	0	-	2	495,000	0	-	1	882,000	2	323,000	-	-	2	4	2	-	2
OREGON	3	640,183	0	-	0	-	0	-	0	-	0	-	0	-	1	-	1	1	-	-	-
PENNSYLVANIA	33	6,809,686	4	547,500	4	288,000	4	569,500	4	280,100	15	1,570,800	16	1,685,200	2	3	25	13	1	-	-
RHODE ISLAND	10	713,574	0	-	1	33,000	6	579,574	6	617,574	0	646,000	7	288,000	-	1	9	-	1	-	-
SOUTH CAROLINA	4	469,000	0	-	0	-	1	160,000	1	120,000	3	309,000	4	469,000	-	1	3	-	1	-	-
SOUTH DAKOTA	2	90,000	0	-	1	52,000	0	-	0	-	0	-	0	-	-	1	-	1	-	-	-
TENNESSEE	7	813,363	0	-	1	425,000	3	282,000	3	758,363	2	539,363	6	813,363	-	-	8	-	1	-	-
TEXAS	29	3,802,990	6	618,000	0	-	3	291,000	13	1,638,860	5	1,821,000	7	546,670	-	2	21	6	5	2	4
UTAH	4	239,600	0	-	0	-	0	-	0	-	0	-	1	74,300	-	-	2	2	-	-	-
VERMONT	1	38,500	0	-	0	-	1	38,500	0	-	0	-	1	-	-	-	-	-	-	-	-
VIRGINIA	17	1,361,200	0	-	2	98,000	9	959,000	6	727,500	10	1,102,500	14	1,361,200	1	2	12	1	3	-	-
WASHINGTON	8	1,179,300	0	-	0	-	0	-	0	-	1	638,500	3	39,000	2	-	3	3	-	-	-
WEST VIRGINIA	11	477,800	2	81,000	1	50,000	4	260,000	3	291,800	6	427,800	5	310,800	-	-	7	-	3	-	-
WISCONSIN	15	1,469,084	1	38,000	2	67,684	11	1,266,584	5	154,684	5	1,001,400	0	-	-	3	7	4	2	-	1
WYOMING	2	65,700	0	-	0	-	0	-	1	32,700	0	-	0	-	-	1	-	1	1	-	1
TOTAL	539	78,499,508	76	10,159,758	44	7,106,899	118	14,493,032	146	20,461,229	208	32,983,849	178	25,170,399	58	37	315	144	99	17	21
1948	465	59,442,445	50	5,729,715	25	1,529,970	-	-	117	12,241,665	133	14,161,595	118	13,768,190	21	25	230	-	-	-	-

Table 10. Summary of Rates of Water Use

(1)	Number of Communities (2)	PLANT OUTPUT* Rated Capacity Million Gallons Daily (3)	Maximum Hour (4)	Maximum Day (5)	Maximum Month (6)	Average Daily Output Million Gallons Daily (7)	Estimated Population Served (8)	Gallons Per Capita Per Day (9)
ALABAMA	7	163.284	9.311	156.100	4061.800	112.300	991,600	113
ARIZONA	2	298.000	8.310	112.300	2946.300	55.700	317,030	176
ARKANSAS	5	55.000	3.329	58.700	1453.000	37.160	342,964	108
CALIFORNIA	44	2156.365	151.577	2483.771	5531.786	1254.430	7,949,100	158
COLORADO	3	264.880	28.075	370.800	8707.460	155.960	746,512	209
CONNECTICUT	21	357.517	18.204	309.720	6816.823	195.045	1,519,695	128
DELAWARE	1	36.000	2.323	279.000	6556.000	24.000	123,900	194
DISTRICT OF COLUMBIA	1	234.000	16.210	263.000	6870.000	167.500	1,103,000	152
FLORIDA	15	359.330	19.543	316.746	8488.700	221.241	1,408,999	157
GEORGIA	10	278.000	8.740	198.500	4669.178	129.480	1,381,000	94
IDAHO	2	59.000	2.290	29.600	772.000	13.430	82,000	164
ILLINOIS	28	685.390	87.729	1768.474	42944.958	1210.058	6,028,650	201
INDIANA	19	402.260	23.042	399.759	8743.430	244.694	1,758,600	139
IOWA	13	179.200	9.519	159.270	3815.000	88.551	823,807	107
KANSAS	5	124.638	8.615	152.520	3860.460	83.370	641,600	130
KENTUCKY	7	163.700	11.034	172.150	4472.000	111.272	900,116	124
LOUISIANA	8	234.500	14.310	261.370	6000.971	156.825	1,249,100	126
MAINE	5	76.000	2.181	45.600	1074.000	31.350	243,974	128
MARYLAND	4	288.700	21.258	316.700	8134.400	252.577	1,802,225	140
MASSACHUSETTS	37	580.500	35.726	543.500	7267.825	369.150	3,308,918	112
MICHIGAN	20	988.550	66.079	1038.693	25015.093	660.796	4,101,500	161
MINNESOTA	6	279.680	15.308	225.660	4965.950	114.100	1,065,280	107
MISSISSIPPI	7	71.500	2.873	61.000	1498.000	43.100	380,000	113
MISSOURI	10	675.800	37.566	612.200	15436.900	348.100	2,363,100	147
MONTANA	3	62.000	3.838	71.100	1687.600	33.500	158,800	211
NEBRASKA	2	130.000	5.977	140.748	3479.277	69.299	420,464	165
NEVADA	2	71.800	3.494	62.100	1733.000	36.100	99,000	365
NEW HAMPSHIRE	3	36.400	1.766	33.800	822.000	18.249	148,000	123
NEW JERSEY	45	880.009	53.359	787.876	16611.012	551.348	3,038,217	181
NEW MEXICO	3	79.600	3.775	57.800	1417.900	29.800	200,500	149
NEW YORK	44	1979.721	149.801	2425.507	62222.430	1547.866	11,651,724	133
NORTH CAROLINA	11	139.250	7.233	141.960	3140.460	92.836	827,000	112
NORTH DAKOTA	2	17.500	0.726	13.900	316.000	7.500	69,000	109
OHIO	34	1198.069	60.152	1167.470	28789.745	784.590	4,890,852	160
OKLAHOMA	6	157.100	13.429	147.200	3747.000	88.300	654,000	135
OREGON	3	212.500	21.100	200.800	4554.000	78.700	640,183	123
PENNSYLVANIA	37	1240.740	70.652	1239.413	37912.168	936.820	6,209,684	151
RHODE ISLAND	9	175.000	6.931	144.670	2850.305	72.320	713,574	101
SOUTH CAROLINA	4	109.000	5.195	85.500	2102.600	52.170	469,000	111
SOUTH DAKOTA	2	30.000	0. 52	29.500	649.000	15.500	90,000	172
TENNESSEE	7	234.250	11.6	233.700	5612.300	155.300	1,238,363	125
TEXAS	23	963.900	50.729	854.250	19458.953	508.666	3,802,950	136
UTAH	3	280.300	5.662	120.510	2943.778	58.500	313,900	186
VERMONT	1	4.000	0.281	4.900	111.000	2.900	38,500	75
VIRGINIA	11	215.420	10.548	211.440	4881.081	135.375	1,361,200	99
WASHINGTON	8	844.682	35.419	601.070	15320.740	365.980	1,206,800	303
WEST VIRGINIA	7	99.200	4.616	76.200	1982.600	60.210	477,800	126
WISCONSIN	18	439.939	27.077	428.870	9614.588	245.228	1,535,084	160
WYOMING	2	29.000	2.130	34.000	732.600	14.300	65,700	218
TOTAL	570	18541.174	1158.894	19649.416	422794.171	12041.546	80,752,965	149

* Adjusted to provide for unreported data.

Table 11. Water Use by Domestic, Commercial, Industrial, and Public and Other, Segments

(1)	Number (2)	Average Output Million Gallons Daily (3)	Domestic		Commercial		Industrial		Public and Other	
			Million Gallons Daily (4)	Average Percent (5)	Million Gallons Daily (6)	Average Percent (7)	Million Gallons Daily (8)	Average Percent (9)	Million Gallons Daily (10)	Average Percent (11)
ALABAMA	5	89.00	39.75	44.7	12.82	14.4	13.75	15.4	22.68	25.5
ARIZONA	1	13.90	9.20	66.2	0.62	4.5	1.88	13.5	2.20	15.8
ARKANSAS	1	18.40	12.00	65.2	0.90	4.9	2.00	10.9	3.50	19.0
CALIFORNIA	14	664.50	367.26	55.3	133.00	20.0	50.52	7.6	113.72	17.1
COLORADO	1	13.96	6.47	46.3	3.23	23.3	2.29	16.4	1.97	14.0
CONNECTICUT	9	127.76	39.46	30.9	28.10	21.9	40.47	31.8	19.73	15.4
DELAWARE	-	-	-	-	-	-	-	-	-	-
DISTRICT OF COLUMBIA	-	-	-	-	-	-	-	-	-	-
FLORIDA	2	14.17	8.60	60.7	1.60	11.2	2.20	15.5	1.77	12.5
GEORGIA	2	72.07	38.91	54.0	22.00	30.5	10.04	13.9	1.12	01.6
IDAHO	2	13.43	9.30	69.2	1.70	12.7	0.44	3.3	1.99	14.8
ILLINOIS	11	116.63	33.80	29.0	19.39	16.6	45.38	38.9	18.06	15.5
INDIANA	14	198.11	72.87	36.8	37.05	18.7	68.02	34.3	20.17	10.2
IOWA	8	61.54	31.53	51.2	10.01	16.3	12.08	19.6	7.92	12.9
KANSAS	3	66.37	19.90	29.9	17.15	25.8	22.39	33.8	6.93	10.5
KENTUCKY	-	-	-	-	-	-	-	-	-	-
LOUISIANA	2	29.70	15.60	52.5	9.50	31.9	4.40	14.9	0.20	0.07
MAINE	1	3.60	2.60	72.2	-	-	1.00	27.8	-	-
MARYLAND	-	-	-	-	-	-	-	-	-	-
MASSACHUSETTS	1	25.90	7.40	28.6	2.40	9.3	9.40	36.2	6.70	25.9
MICHIGAN	2	24.00	6.80	28.3	4.16	17.3	11.57	48.3	1.47	6.1
MINNESOTA	3	92.64	51.11	55.2	10.78	11.6	10.96	11.8	19.79	21.4
MISSISSIPPI	3	15.50	10.70	69.1	0.90	5.8	3.20	20.6	0.70	4.5
MISSOURI	3	24.40	7.40	30.3	8.07	33.1	7.00	28.7	1.93	7.9
MONTANA	1	8.90	4.30	48.3	2.40	27.0	2.00	22.5	0.20	2.2
NEBRASKA	1	53.47	14.75	27.6	10.95	20.5	20.00	37.4	7.77	14.5
NEVADA	-	-	-	-	-	-	-	-	-	-
NEW HAMPSHIRE	-	-	-	-	-	-	-	-	-	-
NEW JERSEY	-	-	-	-	-	-	-	-	-	-
NEW MEXICO	1	3.00	2.39	79.7	0.44	14.7	0.16	5.3	0.01	0.3
NEW YORK	-	-	-	-	-	-	-	-	-	-
NORTH CAROLINA	10	84.03	47.65	56.7	9.27	11.0	21.43	25.5	5.68	6.8
NORTH DAKOTA	2	7.50	3.15	42.0	3.15	42.0	1.20	16.0	-	-
OHIO	13	236.21	91.49	38.8	30.96	13.1	99.56	42.1	14.20	6.0
OKLAHOMA	2	32.80	17.10	52.2	12.40	37.8	0.50	1.5	2.80	8.5
OREGON	2	18.70	8.90	47.6	4.75	25.4	4.45	23.8	0.60	3.2
PENNSYLVANIA	8	108.81	32.88	30.2	18.59	17.1	32.89	30.2	24.45	22.5
RHODE ISLAND	2	41.13	13.80	33.6	5.97	14.5	20.58	50.0	0.78	1.9
SOUTH CAROLINA	2	30.60	8.75	28.6	6.75	22.0	11.50	37.6	3.60	11.8
SOUTH DAKOTA	2	13.62	4.74	34.8	2.86	21.0	1.96	14.4	4.06	29.8
TENNESSEE	4	78.80	19.86	25.2	15.25	19.3	32.05	40.7	11.64	14.8
TEXAS	6	91.70	49.07	53.5	11.86	12.9	23.67	25.8	7.10	7.8
UTAH	1	56.30	34.50	61.3	7.70	13.7	7.90	14.0	6.20	11.0
VERMONT	1	2.90	1.40	48.3	0.50	17.2	0.80	27.6	0.20	6.9
VIRGINIA	4	42.15	20.66	49.0	11.76	27.9	8.23	19.5	1.50	3.6
WASHINGTON	1	54.22	8.40	15.5	17.02	31.4	17.03	31.4	11.77	21.7
WEST VIRGINIA	3	27.41	8.72	31.8	6.83	24.9	10.03	36.6	1.83	6.7
WISCONSIN	15	221.53	59.15	26.7	44.33	20.0	87.80	39.6	30.25	13.7
WYOMING	1	4.70	2.30	49.0	0.80	17.0	-	-	1.60	34.0
TOTAL	170	2904.06	1244.62	42.8	547.92	18.9	722.73	24.9	388.79	13.4

Table 12. Adequacy of Systems for Maximum Demand and Improvements Needed

(1)	Number of Systems which are:			IMPROVEMENTS NEEDED*									
	Adequate (2)	Inadequate (3)	Unreported (4)	No Needs (5)	Other (6)	Unreported (7)	U (8)	S (9)	M (10)	P (11)	T (12)	D (13)	L (14)	G (15)
ALABAMA	6	1	0	0	0	2	1	1	0	0	2	4	3	0
ARIZONA	2	0	0	0	0	1	0	0	0	0	0	1	0	0
ARKANSAS	0	5	0	0	0	0	0	2	3	1	3	5	5	0
CALIFORNIA	23	0	21	0	0	15	7	3	17	8	7	14	9	15
COLORADO	2	0	1	0	0	0	1	3	2	2	3	3	2	2
CONNECTICUT	10	4	7	0	0	6	2	5	6	6	2	4	4	3
DELAWARE	1	0	0	0	0	1	0	0	0	0	0	0	0	0
DISTRICT OF COLUMBIA	0	0	1	0	0	0	1	1	1	1	1	0	0	1
FLORIDA	1	4	10	0	0	8	3	0	5	3	4	6	4	4
GEORGIA	4	1	5	0	0	4	3	2	3	5	2	4	3	1
IDAHO	1	1	0	0	0	0	1	0	1	1	0	2	1	0
ILLINOIS	14	4	10	1	4	7	2	4	5	12	11	10	10	5
INDIANA	14	5	0	0	1	3	5	2	8	7	8	8	6	2
IOWA	11	1	1	0	0	3	3	0	2	2	3	5	6	0
KANSAS	5	0	0	0	0	1	1	1	3	1	2	2	2	2
KENTUCKY	7	0	0	0	0	0	0	0	5	4	4	7	4	1
LOUISIANA	5	1	2	0	0	2	3	0	2	0	2	4	5	3
MAINE	4	1	0	0	0	3	0	0	0	1	0	1	0	0
MARYLAND	3	1	0	0	0	1	0	1	1	1	3	3	2	2
MASSACHUSETTS	28	8	1	0	0	7	1	3	6	3	6	8	6	0
MICHIGAN	10	7	3	0	0	4	2	3	8	7	6	8	8	3
MINNESOTA	3	1	2	0	0	1	1	0	1	2	2	3	2	0
MISSISSIPPI	5	1	1	0	0	2	0	1	1	2	1	4	3	2
MISSOURI	7	0	3	0	0	1	2	3	4	3	4	5	2	1
MONTANA	3	0	0	0	0	1	0	0	1	0	1	2	1	0
NEBRASKA	0	1	1	0	0	0	1	1	2	2	2	2	1	1
NEVADA	1	1	0	0	1	0	0	1	1	1	1	2	2	0
NEW HAMPSHIRE	0	0	3	0	0	3	0	0	0	0	0	0	0	0
NEW JERSEY	15	0	30	0	0	18	3	1	3	2	1	3	3	0
NEW MEXICO	1	0	2	0	0	0	2	0	1	3	1	2	0	1
NEW YORK	25	1	18	0	0	12	7	2	8	12	15	9	9	6
NORTH CAROLINA	9	1	1	1	0	3	0	2	3	3	5	4	2	0
NORTH DAKOTA	1	0	1	0	0	1	0	0	0	0	1	0	0	0
OHIO	24	1	9	0	0	9	2	7	10	9	9	13	15	8
OKLAHOMA	1	2	3	0	0	1	3	2	4	3	1	4	2	1
OREGON	2	1	0	0	0	0	0	0	1	1	0	3	1	2
PENNSYLVANIA	17	2	18	0	0	11	1	9	11	11	10	14	8	7
RHODE ISLAND	4	2	3	0	0	3	3	1	2	0	1	2	2	0
SOUTH CAROLINA	3	1	0	0	0	2	0	0	2	0	0	1	0	0
SOUTH DAKOTA	0	2	0	0	0	0	1	1	1	1	1	2	1	1
TENNESSEE	3	1	3	0	0	3	1	0	3	1	1	3	2	0
TEXAS	10	11	2	0	1	4	5	9	13	12	10	14	15	11
UTAH	1	0	2	0	0	0	1	0	0	0	2	1	0	2
VERMONT	1	0	0	0	0	0	0	0	1	0	0	0	0	0
VIRGINIA	8	2	1	0	0	0	2	5	7	5	4	7	6	5
WASHINGTON	7	0	1	1	0	0	1	3	6	2	1	5	3	3
WEST VIRGINIA	5	1	1	0	0	2	0	2	0	3	2	3	3	1
WISCONSIN	13	3	2	1	0	5	5	1	6	8	4	6	7	2
WYOMING	2	0	0	0	0	0	2	0	0	0	0	1	1	0
TOTAL	322	79	169	4	7	150	79	82	169	150	149	214	173	103

* Improvements Needed: U-Source, underground; S-Source, surface; M-Transmission; P-Pumping; T-Treatment; D-Distribution System; Distribution Storage - L-Elevated, G-Ground; "Other" - Other than those listed above.